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A POSSIBLE CLUE FOR CAUSE OF PLANE CRASHES

A possible clue to one of the factors that may have played a part in some of the recent airplane crashes, the cause of which has mystified investigators, is suggested by C. C. Bunch, Ph.D., St. Louis.

In his discussion of "The Problem of Deafness in Aviators," Dr. Bunch says: "Newspaper accounts of the investigations of recent airplane accidents do not mention the hearing ability of the pilots involved. The reports of the circumstances of several accidents lead one to think that in certain instances the pilots were not following the radio beam. In that at Salt Lake City the newspaper account stated that the plane was approaching the landing field on the radio beam. A few moments later the pilot turned off his course. A storm was in progress at the time. In the recent Chicago accident it was reported that the pilot was attempting to land on the wrong runway. A snow storm was in progress.

"As in the case of the graduate student whose audiogram is recorded [in a chart in the article], the pilot may not be aware of any hearing loss at all. On the other hand, if he did know of it but was unaware of its significance in his profession, it would be human nature for him to attempt to conceal it. These problems may be solved only by frequent accurate audiometric tests by competent examiners."

In his comment on the general problems presented by the subject, Dr. Bunch says that blacksmiths' deafness has been known since 1830 and that as the steel industry developed this peculiar form of deafness became sufficiently well known to be called boilermakers' deafness.

"According to the best information available," he continues, "the noise in a boiler shop reaches an intensity of level of about 100 decibels and that from an airplane motor about 110 decibels. If continuous exposure to the noise in a boiler shop results in diminished hearing, it is logical to expect that . . . the louder noise [of airplane motors] will produce hearing losses more frequently and more quickly. . . .

"There is no evidence that the ordinary use of the telephone will result in deafness. . . .

"The public knows that the pilots of modern planes are at times in communication with the radio stations located at landing fields. . . . Whether the conditions under which he must use his radio would result in diminished hearing is not known to the interested public. . . . Padden, discussing Wright's paper entitled 'Medical Supervision of Air Lines,' made these significant remarks:

" 'The increasing importance of radio and radio beams finds a condition of static ears occurring in quite a number of pilots. It requires intense concentration for a pilot to listen four hours to *ta-ti-ta.* Occasionally I sit up front and stick the ear phones on and I don't wonder they get static ears with electrical storms, etc. I think I'd have static ears in one trip.'

"Just what he meant by 'static ears' is difficult to understand. It is possible that the static which occurs during thunder storms might cause temporary or permanent hearing losses which would adversely affect the pilot's efficiency?

'Nearly every one has had the unpleasant experience of attempting to use a telephone located in a noisy place. The pilot must use his radio in the presence of the roar of the motors of his ship, and in order to hear it he must turn it on louder than would ordinarily be necessary. Unfortunately, as he increases the loudness of his radio signal he must also increase the loudness of the static, thus creating a grave situation to say the least. . . ."

In summarizing his discussion, Dr. Bunch says:

"It is not scientific to assume that hearing losses which have been found in those who are employed in one industry will be found in those employed in another unless a common cause exists. In this instance it appears that a common cause, that is, excessively loud noise, exists. The following conclusions appear to be definite but cannot be proved without more complete investigation:

"1. The best evidence available indicates that the loud noises of airplanes and airplane motors often cause definite hearing losses in pilots.

"2. All pilots are not affected to the same degree.

"3. The hearing loss most frequently encountered in those who have been exposed to loud noises is for tones near c-4 (2048 double vibrations) and c-5 (4096 double vibrations). As the loss progresses with continued exposure, the acuity for tones of lower pitch is also affected.

"4. Pilots who have decreased acuity for tones near c-3 (1024 double vibrations) will have difficulty in understanding certain words over the radio and may not be able to understand exact landing instructions.

"5. If the radio guide beam has a frequency near c-3 (1024 double vibrations) pilots with [decreased] hearing losses [for tones near c-3] can follow it only when they keep their radios tuned on louder than is ordinarily necessary.

"6. Lightning-created static in the ears of

pilots who have their radios turned on loud may cause additional temporary or permanent hearing losses and incapacitate them to such an extent that they may be unable to hear the radio beam.

"7. The hearing loss in aviators is not unlike that in other persons who are constantly exposed to sounds of great intensity.

"8. Hearing losses of this type often escape detection. Those affected may be unaware of it. It cannot often be discovered in spoken voice tests as they are ordinarily conducted.

"9. A systematic study of the hearing of aviators should settle the dispute which exists among those who have interested themselves in this subject. It should determine (1) whether certain fliers are more susceptible than others to hearing losses caused by the noise of airplanes, (2) whether certain types of planes or motors are more harmful to hearing than others, (3) whether it is possible to develop adequate protective devices for the ears, (4) whether certain candidates should be excused from this type of training because they are more susceptible than others to the effects of noise and (5) whether selection and protection cannot raise the efficiency and safety of the flying services."

MEDICAL EPONYM

Jackson's Membrane

Jabez N. Jackson (1868-1935), of Kansas City, Missouri, read a paper before the Western Surgical Society at Minneapolis, Minnesota, in December, 1908, entitled "Membranous Pericolitis." This was printed with revisions and additions in *Surgery, Gynecology and Obstetrics* (9:278-287, 1909).

"Wherever . . . we find any late manifestations of peritoneal disturbance about the colon we have been content to label it 'adhesions,' presume an antecedent acute appendicitis, and pass on. Some very striking . . . observations . . . have persuaded [the writer] that there is a most interesting pathological condition occurring about the right colon which can not thus readily be set aside. . . . The following description . . . is . . . from the report of Dr. Frank Hall, pathologist. . . . 'From a point just at the hepatic flexure to three inches above the caput there spreads from the parietal margin over the external lateral margin to the internal longitudinal muscle band a thin vascular veil.'"

"Synchronously with our recognition of the distinct pathology and clinical identity of this condition, we had been impressed with the view that this pericolonic membrane by its mechanical interference with colonic peristalsis was possibly, if not probably, responsible for the chain of symptoms which were manifest when it was found present."—R. W. B., in *New England Journal of Medicine*, Vol. 225, No. 5.

MEDICAL EPONYM

Ewing's Sarcoma

Dr. James Ewing, oncologist and professor of pathology at Cornell University Medical College, New York City, discussed "Diffuse Endothelioma of Bone" before the New York Pathological Society and published his paper in the *Proceedings of the New York Pathological Society* (21:17-24, 1921).

"For some years I have been encountering in material curetted from bone tumors a structure which differed markedly from that of osteogenic sarcoma, was not identical with any known form of myeloma, and which had to be designated by the vague term "round cell sarcoma" of unknown origin and nature. . . . They occurred in subjects from fourteen to nineteen years of age. The tumors grew rather slowly, requiring some months to attract attention, but they were accompanied by attacks of pain and disability. . . . The radiographs give characteristic features on which a diagnosis may be based with considerable certainty. A large portion or the whole of the shaft is involved, but the ends are generally spared, contrary to the rule with osteogenic sarcoma. The shaft is slightly widened, but the main alteration is a gradual diffuse fading of the bone structure. Bone production has been entirely absent. Some of the bones appeared honeycombed. Perforation of the shaft and sharp limitation of the process are wanting. The central excavation with widened bony capsule, as seen in benign giant cell tumors, is missing. . . . The probable endothelial nature of the tumor was suggested by the form of the cells, and especially by the appearance in broad sheets of polyhedral cells without intervening stroma. . . . The possible relation of the endothelial tumor to plasma cell or other forms of multiple myeloma deserves consideration."—R. W. B., in *New England Journal of Medicine*, Vol. 223, No. 21.

MEDICAL EPONYM

Krönig's Isthmus

Dr. Georg Krönig (1856-1911), docent in the University of Berlin, published his paper "Zur Topographie der Lungenspitzen und ihrer Percussion (On the Topography and Percussion of the Lung Apices)" in the *Berliner klinische Wochenschrift* (26:809-812, 1889). A portion of the translation follows:

"The examination of a patient who had been referred to me was the beginning of a series of determinations of the borders of the lung apices, as well as the lung margins which I briefly report here. After I had determined the anterior supraclavicular margin of the lung in the usual fashion, that is by gentle percussion, I proceeded, still percussing very lightly to the posterior aspect and thereby obtained the following results. On the right side, as on the left, there appeared a line that extended medially in a wide arch, with its convexity directed inward, and approached to within a centimeter of the midline on the left at the level of a line between the second and third thoracic spines, on the right at the level of the fourth thoracic spine. In this case, the right apex was diseased . . . while the left showed a normal condition. . . . Inasmuch as I had obviously been successful in determining not only the height of the lung apices but also their breadth, . . . I tried to determine similarly the lateral margin. . . . The determination of the posterior lateral border is easy in many cases, especially in thin persons, but is frequently difficult in powerfully built, extremely muscular, or fat persons. The lateral border, which I have outlined on the anterior surface is extremely trustworthy. It runs from about the middle of the anterior margin of the trapezius muscle, curves down sharply, cuts the clavicle at about the line between its middle and outer third, and then courses outward diagonally to the axilla. From the configuration of these normal clinical margins, it will now be possible, without great difficulty, to hypothecate the necessary shift that will occur when there are pathologic changes in the lung apices. Diseases that reduce the air content will shift the medial border outward and the lateral border inward."—R. W. B., in *New England Journal of Medicine*, Vol. 225, No. 18.